

IN THE CLAIMS

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1. (Currently Amended) A signal processor comprising:

- a data compression encoder which operates to compression encode source data into compression encoded data having a variable compressed data rate,
- a multiplexer coupled to said data compression encoder and arranged in operation to concatenate said compressed data and descriptive metadata ~~ancillary data~~ into a concatenated data stream, the metadata describing the content of the source data, and
- a control processor coupled to said multiplexer and arranged in operation to control said multiplexer whereby a combined data rate of said concatenated data stream is less than or equal to a pre-determined maximum;

whereby said metadata ~~ancillary data~~ is concatenated with compressed data corresponding to two or more non-contiguous frames of video data.

2. (Original) A signal processor as claimed in Claim 1, wherein said data compression encoder is arranged in operation to generate said compression encoded data in accordance with a compression encoding algorithm. the compressed data rate being varied by said compression encoding algorithm in dependence upon the content of said source data.

3. (Original) A signal processor as claimed in Claim 1, wherein said compressed data rate is varied by said compression encoding algorithm in dependence upon an estimated comparison of

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said source data and a version of said source data produced by decompressing said compression encoded data.

4. (Currently Amended) A signal processor as claimed in Claim 2, wherein said control processor is coupled to said compression encoder and arranged in operation to influence said compression encoding algorithm to an effect of controlling said compressed data rate produced by said compression encoder whereby a pre-determined data rate is provided within said concatenated data stream for said metadata ~~ancillary data~~.

5. (Currently Amended) A signal processor as claimed in Claim 4, wherein said control processor is arranged in operation to maintain the compressed data rate at a pre-determined minimum, said pre-determined data rate provided for said metadata ~~ancillary data~~ being determined in accordance with a difference between said pre-determined minimum data rate and said pre-determined maximum data rate.

6. (Currently Amended) A signal processor according to claim 1, wherein said control processor is arranged in operation

- to determine a target data rate for said compression encoded data rate in dependence upon an amount of said metadata ~~ancillary data~~ to be concatenated into said concatenated data stream, and

- to control said compression encoder to maintain said target bit rate.

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7. (Currently Amended) A processor according to claim 2, wherein the target bit rate is a rate T_b which is pre-set at a predetermined percentage of the maximum bit rate and the amount of metadata ~~ancillary data~~ to be added.

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8. (Original) A signal processor as claimed in Claim 1, wherein said compression algorithm is arranged in operation

- to generate an encoded representation of said source data, and
- to quantise said encoded data to produce said compression encoded data, wherein said influence of said compression encoding algorithm is effected by controlling said quantisation of said encoded data representative of said source data in order to control said compressed data rate.

9. (Previously Presented) A signal processor as claimed in Claim 8, wherein said encoded representation of said source data is formed using a discrete cosine transform.

10. (Previously Presented) A signal processor as claimed in Claim 9, wherein said compression encoding algorithm is an MPEG type algorithm.

11. (Original) A signal processor as claimed in Claim 1, wherein said compression encoder produces said compression encoded data as encoded data frames.

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12. (Currently Amended) A signal processor as claimed in Claim 11, wherein said control processor is arranged in operation to determine said target bit rate as an average target data rate TBR_{ave} , in accordance with the following expression $TBR_{ave} = M-D/m$, where the maximum bit rate is M, the amount of metadata ~~ancillary data~~ is D, and m is the number of frames over which the metadata ~~ancillary data~~ is to be concatenated to the encoded signal.

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13. (Currently Amended) A signal processor as claimed in Claim 12, wherein the number of frames over which the metadata ~~ancillary data~~ is to be concatenated m is reduced by 1 upon the encoding of each frame and the amount of metadata ~~ancillary data~~ D is reduced by F_n upon the encoding of each frame where F_n is the amount of data symbols in the encoded frame.

14. (Original) A signal processor as claimed in Claim 1, wherein the source data is representative of audio signals or video signals, or audio and video signals.

15. (Cancelled)

16. (Currently Amended) A data recording apparatus comprising

- a signal processor as claimed in Claim 1 arranged in operation to produce a concatenated data stream of compression encoded data and metadata ~~ancillary data~~, and
- a recording drive arranged in operation to record the concatenated data stream produced by the signal processor onto a recording medium, the predetermined maximum data rate of the

combined data rate of the concatenated data stream being determined in accordance with the bandwidth of the recording medium.

17. (Original) A data recording apparatus as claimed in Claim 16, wherein said concatenated data is arranged to be recorded in helical scan tracks on said recording medium.

18. (Currently Amended) A data recording apparatus as claimed in Claim 17, wherein the encoded data produced by the signal processor as part of the concatenated data stream is divided into frames and said recording drive operates to record one of said frames per track, metadata ~~ancillary data~~ being recorded in the remainder of said track.

19. (Currently Amended) A communications apparatus which operates to communicate source data, comprising,

- a signal processor as claimed in Claim 1, which is arranged in operation to produce a concatenated data stream, which includes the source data represented as compression encoded data with metadata ~~ancillary data~~, and

- a transmission channel having a predetermined bandwidth, wherein the predetermined maximum data rate of the concatenated data stream is determined in dependence upon the predetermined bandwidth.

20. (Currently Amended) A method of processing source data comprising the steps of

- compression encoding the source data into compression encoded data having a variable compressed data rate,

- concatenating said compressed data and descriptive metadata ~~ancillary data~~ into a concatenated data stream, the metadata describing the content of the source data, wherein a combined data rate of said concatenated data stream is less than or equal to a pre-determined maximum;

whereby said metadata ~~ancillary data~~ is concatenated with compressed data corresponding to two or more non-contiguous frames of video data.

21. (Original) A method as claimed in Claim 20, wherein the step of compression encoding the source data is performed in accordance with a compression encoding algorithm, the compressed data rate being varied by said compression encoding algorithm in dependence upon the content of said source data.

22. (Currently Amended) A method as claimed in Claim ~~Claims~~ 20, wherein said compressed data rate is varied by said compression encoding algorithm in dependence upon an estimated comparison of said source data and a version of said source data produced by decompressing said compression encoded data.

23. (Currently Amended) A method as claimed in Claim 20 ~~in any of Claims 20~~, wherein the step of compression encoding the source data comprises the step of

- influencing said compression encoding algorithm to an effect of controlling said compressed data rate whereby a pre-determined data rate is provided within said concatenated data stream for said metadata ~~ancillary~~ data.

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24. (Currently Amended) A method as claimed in Claim 23, wherein the step of compression encoding the source data comprises the steps of

- maintaining the compressed data rate at a pre-determined minimum, said method comprising the steps of

- determining a data rate for said metadata ~~ancillary~~ data from a difference between said pre-determined minimum data rate and said pre-determined maximum data rate, and the step of concatenating said compression encoded data and said metadata ~~ancillary~~ data comprises the step of

- concatenating said metadata ~~ancillary~~ data at said determined rate.

25. (Currently Amended) A method as claimed in Claim 23, wherein the step of compression encoding the source data comprises the steps of

- determining a target data rate for said compression encoded data rate in dependence upon an amount of said metadata ~~ancillary~~ data to be concatenated into said concatenated data stream, and

- controlling said compression encoder to maintain said target bit rate.

26. (Currently Amended) A method as claimed in Claim 25, wherein the target data rate is a rate T_b which is pre-set at a predetermined percentage of the maximum data rate and the amount of metadata ancillary data added to each frame is dependent on $M-T_b$.

27. (Currently Amended) A method as claimed in Claim 20 ~~in any of Claims 20~~, wherein the step of compression encoding said source data comprises the steps of

- generating an encoded representation of said source data, and
- quantising said encoded data to produce said compression encoded data, wherein the step of influencing said compression encoding algorithm comprises the step of
- controlling said quantisation of said encoded data representative of said source data in order to control said compressed data rate.

28. (Previously Presented) A method as claimed in Claim 27, wherein the step of generating an encoded representation of said source data is formed using a discrete cosine transform.

29. (Previously Presented) A method as claimed in Claim 28, wherein said compression encoding algorithm is an MPEG type algorithm.

30. (Currently Amended) A method as claimed in Claim 20 ~~in any of Claims 20~~, wherein the step of compression encoding said source data comprises the step of

- producing compression encoded data frames.

31. (Currently Amended) A method as claimed in Claim 30, wherein the step of determining said target data rate comprises the step of

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- determining said target data rate as an average target bit rate TBR_{ave} , in accordance with the following expression $TBR_{ave} = M - D/m$, where the maximum data rate is M, the amount of metadata ancillary data is D, and m is the number of frames over which the metadata ancillary data is to be concatenated to the encoded signal.

32. (Currently Amended) A method as claimed in Claim 31, wherein the step of determining the target data rate comprises the step of

- reducing by 1 a number of frames m over which the metadata ancillary data is to be concatenated is reduced by 1 upon the encoding of each frame, and
- reducing the amount of metadata ancillary data D by F_n upon the encoding of each frame where F_n is the number of data symbols in the encoded frame.

33. (Original) A method as claimed in Claim 20, wherein the source data is representative audio signals or video signals, or audio and video signals.

34. (Cancelled)

35. (Original) A method of recording data comprising

- producing a concatenated data stream according to the data processing method claimed in Claim 20, and

- recording the concatenated data stream onto a recording medium, the predetermined maximum data rate of the combined data rate of the concatenated data stream being determined in accordance with the bandwidth of the recording medium.

36. (Original) A method of recording data as claimed in Claim 35, wherein the step of recording comprises the step of

- recording said concatenated data stream in helical scan tracks on said recording medium.

37. (Currently Amended) A method of recording data as claimed in Claim 36, wherein the step of producing said concatenated data stream comprises

- dividing said concatenated data stream into frames, and the step of recording comprises the steps of

- recording one of said frames per track, and

- recording metadata ~~ancillary data~~ in the remainder of said track.

38. (Currently Amended) A method of communicating source data comprising the steps of

- producing a concatenated data stream according to the data processing method claimed in Claim ~~Claims~~ 20, which includes the source data represented as compression encoded data with metadata ~~ancillary data~~, and

- communicating the concatenated stream via a transmission channel having a predetermined bandwidth, wherein the predetermined maximum data rate of the concatenated data stream is determined in dependence upon the predetermined bandwidth.

39. (Original) A computer program providing computer executable instructions, which when loaded onto a computer configures the computer to operate the data processor as claimed in claim 1.

40. (Original) A computer program providing computer executable instructions, which when loaded on to a computer causes the computer to perform the method according to claim 20.

41. (Previously Presented) A computer program product comprising a computer readable medium having recorded thereon information signals representative of the computer program claimed in claim 39.

42. (Previously Presented) A computer program product comprising a computer readable medium having recorded thereon information signals representative of the computer program claimed in claim 40.